Patent Claims

1. Particles having a multilayered structure based on substrates, characterised in that the substrates are coated with one or more layers of one or more polymers and one or more layers of one or more silanes.

2. Particles according to Claim 1, characterised in that the layers are alternating layers of polymers and silanes.

3. Particles according to Claim 1 or 2, characterised in that the substrates are coated with a layer of one or more polymers and a layer of one or more silanes applied thereto.

4. Particles according to Claim 1 or 2, characterised in that the substrates are coated with a layer of one or more silanes and a layer of one or more polymers applied thereto.

5. Particles according to one of Claims 1 to 4, characterised in that the substrates are in flake form.

6. Particles according to one of Claims 1 to 5, characterised in that the substrate is selected from the group consisting of SiO_2 particles, TiO_2 particles, effect pigments, holographic pigments, pearlescent pigments, interference pigments, multilayered pigments, metal-effect pigments and/or BiOCl pigments.

7. Particles according to Claim 6, characterised in that the effect pigments, holographic pigments, pearlescent pigments, interference pigments, multilayered pigments and/or metal-effect pigments are based on supports of natural or synthetic mica, Al_2O_3 flakes, TiO_2 flakes, SiO_2 flakes,

Fe_2O_3 flakes, glass flakes, ceramic flakes, metal flakes or graphite flakes.

8. Particles according to one of Claims 1 to 7, characterised in that the one or more polymers are selected from the group consisting of polyethers, polyacrylates, polyvinylcaprolactams, cellulose, polystyrenes, polyvinyl alcohols, polyvinyl acetates, polysiloxanes, derivatives of the said polymers or mixtures thereof.

9. Particles according to one of Claims 1 to 8, characterised in that the polymers are LCST and/or UCST polymers or polymers containing solvolysable groups.

10. Particles according to one of Claims 1 to 9, characterised in that the one or more polymer layers additionally comprise additives.

11. Particles according to one of Claims 1 to 10, characterised in that the one or more silanes are selected from the group consisting of the organosilanes having the general formula

$$X_{4-n-m}Z\text{-}R_n(\text{-}B\text{-}Y)_m$$

where X = OH, halogen, alkoxy or aryloxy
Z = Si
R = alkyl, phenyl or hydrogen
B = organic, at least bifunctional group (alkylene, alkyleneoxyalkylene)
Y = alkyl, amino, substituted amino, hydroxyl, hydroxyalkyl, siloxane, acetoxy, isocyanate, vinyl, acryloyl, epoxide, epoxypropyloxy, imidazole or ureido group
n and m = 0, 1, 2 or 3, where $n+m \leq 3$.

12. Process for the production of particles having a multilayered structure according to Claim 1, characterised in that substrates are coated with one or more layers of one or more polymers and one or more layers of one or more silanes.

13. Process according to Claim 12, characterised in that the coating with one or more polymers is carried out by precipitation in water and/or organic solvents, by polycondensation reactions, by polyaddition reactions and/or by free-radical polymerisation.

14. Process according to Claim 12 or 13, characterised in that the polymers are LCST and/or UCST polymers or polymers containing solvolysable groups.

15. Process according to one of Claims 12 to 14, characterised in that the silanes are applied by precipitation in water and/or organic solvents.

16. Use of particles having a multilayered structure according to Claim 1 in surface coatings, water-borne coatings, powder coatings, paints, printing inks, toners, safety elements, plastics, concrete, in cosmetic formulations, in agricultural sheeting and tent awnings and for the preparation of pigment compositions and dry preparations.

17. Surface coatings, water-borne coatings, powder coatings, paints, printing inks, toners, safety elements, plastics, concrete, cosmetic formulations, agricultural sheeting, tarpaulins, pigment compositions and dry preparations comprising particles having a multilayered structure according to Claim 1.